

# Chapter 13. PDS Objects

The Planetary Data System has designed a set of standard objects to be used for submitting catalog object information as well as for labeling data products. These standard objects, along with definitions of individual keywords comprising those objects, are defined in the *Planetary Science Data Dictionary*. In addition, object definitions and examples are also included in Appendix A and Appendix B of this document.

## 13.1 Generic and Specific Data Object Definitions

For each type of data object that PDS has defined (i.e., IMAGE, TABLE, etc.), there are two categories of definitions: generic and specific. A *generic object definition* is the universal definition of an object, or superset of keywords that can be used. A *specific object definition* is a subset of keywords used for a particular data product to allow effective use of validation tools.

Generic object definitions are designed and approved by the Planetary Data System, and defined in the *Planetary Science Data Dictionary*. Each object definition lists the elements and sub-objects required to be present each time the object is used in a product label. The dictionary definition also provides a list of additional, optional keywords that are frequently used by data preparers. Finally, note that any element defined in the PSDD may be included as an optional element in any object definition, at the discretion of the data preparer.

A specific object definition is defined for a particular data product and is based on a single generic object. The data preparer, in consultation with a data engineer, combines all the required elements of that object with a set of optional elements selected for their relevance to the data at hand. The result is a specific object definition. This definition is subject to approval during a design review.

The following examples illustrate the evolution from the generic IMAGE object to a specific IMAGE object, followed by an instance of that specific IMAGE. Note that when a specific object definition is created and used, the usage should be consistent for all labels using that object.

```
OBJECT                = GENERIC_OBJECT_DEFINITION
NAME                  = IMAGE
STATUS_TYPE           = APPROVED
STATUS_NOTE           = "V2.1 1991-01-20 MDM New Data Object Definition"
DESCRIPTION           = "An image object is a regular array of sample
values. Image objects are normally processed with special display tools to
produce a visual representation of the sample values. This is done by assigning
brightness levels or display colors to the various sample values. Images are
composed of LINES and SAMPLES. They may contain multiple bands, in one of
several storage orders."
```

Note: Additional engineering values may be prepended or appended to each LINE of an image, and are stored as concatenated TABLE objects, which must be named LINE\_PREFIX and LINE\_SUFFIX. IMAGE objects may be associated with other objects, including HISTOGRAMs, PALETTEs, HISTORYs and TABLEs which contain statistics, display parameters, engineering values or other ancillary data."

```

SOURCE_NAME                = "PDS CN/M.MARTIN"
REQUIRED_ELEMENT_SET       = {LINE_SAMPLES,
LINES, SAMPLE_BITS,
                             SAMPLE_TYPE}
OPTIONAL_ELEMENT_SET       = {BAND_SEQUENCE,
BAND_STORAGE_TYPE,
                             BANDS, CHECKSUM, DERIVED_MAXIMUM,
                             DERIVED_MINIMUM, DESCRIPTION,
                             ENCODING_TYPE, FIRST_LINE,
                             FIRST_LINE_SAMPLE, INVALID,
                             LINE_PREFIX_BYTES, LINE_SUFFIX_BYTES, MISSING,
                             OFFSET, SAMPLE_BIT_MASK, SAMPLING_FACTOR,
                             SCALING_FACTOR, SOURCE_FILE_NAME,
                             SOURCE_LINES, SOURCE_LINE_SAMPLES,
                             SOURCE_SAMPLE_BITS, STRETCHED_FLAG,
                             STRETCH_MAXIMUM, STRETCH_MINIMUM, PSDD}
REQUIRED_OBJECT_SET        = "N/A"
OPTIONAL_OBJECT_SET        = "N/A"

OBJECT_CLASSIFICATION_TYPE = STRUCTURE

OBJECT                     = ALIAS
NAME                       = "N/A"
USAGE_NOTE                 = "N/A"
END_OBJECT                 = ALIAS

END_OBJECT                 = GENERIC_OBJECT_DEFINITION

```

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This next example illustrates an IMAGE object definition being used for a specific case.

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```

OBJECT                     = SPECIFIC_OBJECT_DEFINITION
NAME                       = XYZ_IMAGE
STATUS_TYPE               = APPROVED
STATUS_NOTE               = "V2.1 1991-02-10  TMA New specific data object
                             definition"
DESCRIPTION               = "The XYZ image is..."

SOURCE_NAME               = "PDS CN/M.MARTIN"
REQUIRED_ELEMENT_SET       = {LINE_SAMPLES, LINES, SAMPLE_BITS,
                             SAMPLE_TYPE, SAMPLING_FACTOR,
                             SOURCE_FILE_NAME,
                             SOURCE_LINES, SOURCE_LINE_SAMPLES,
                             SOURCE_SAMPLE_BITS, FIRST_LINE,
                             FIRST_LINE_SAMPLE}

OBJECT_CLASSIFICATION_TYPE = STRUCTURE

OBJECT                     = ALIAS
NAME                       = "N/A"
USAGE_NOTE                 = "N/A"
END_OBJECT                 = ALIAS

END_OBJECT                 = SPECIFIC_ OBJECT_DEFINITION

```

## 13.2 Primitive Objects

Generic objects have a subclass called primitive objects that includes the ARRAY, COLLECTION, ELEMENT, and BIT\_ELEMENT objects. The primitive objects are used as the

building blocks for describing very irregular data that cannot be accommodated by any other generic object. If at all possible, standard, well-supported generic objects (such as TABLE and IMAGE) should be used to describe archival data.

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